

**From:** Richard Fetzer/R3/USEPA/US  
**Sent:** 1/29/2013 9:59:15 AM

**To:** Richard Rupert/ESC/R3/USEPA/US; Kappelman.David@epamail.epa.gov; Myles Bartos/R3/USEPA/US@EPA; wagner.christine@epa.gov  
**CC:**  
**Subject:** Fw: Harvard Law Center correspondence on WMGR064 (background rad)

I am forwarding this email for various reasons....

Myles - non-responsive  
Rupert/Kappelman/Wagner - John discusses the issue of radiological issues in natural gas drilling. thought you would be interested in reading it.

just FYI for all. some of this is obvious DEP issues...feel free to ignore those sections.

Rich

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----- Forwarded by Richard Fetzer/R3/USEPA/US on 01/29/2013 09:57 AM -----

From: Mellow5n2@aol.com  
To: grushki@hotmail.com, Richard Fetzer/R3/USEPA/US@EPA  
Date: 01/28/2013 10:42 AM  
Subject: Fwd: Harvard Law Center correspondence on WMGR064 (background rad)

FYI

From: Mellow5n2@aol.com  
To: Mellow5n2@aol.com, jmmurph@verizon.net, oscette@ptd.net, robelewis@pa.gov, jiannuzzo@pa.gov, werner.lora@epa.gov, rbisignani@pa.gov

Sent: 1/28/2013 10:29:04 A.M. Eastern Standard Time

Subj: Re: Harvard Law Center correspondence on WMGR064 (background rad)

It is interesting that PADEP is doing a detailed radiological survey of cuttings, liquids, and so forth. I do recall seeing an Army Corp article (recollection of Louisiana or another deep south state) where well pipe had to be disposed due to radiological contamination from natural gas drilling. While it is good that this study is being done, there seems to be unresolved questions from quite some time that have not been addressed. The point of this email is just to point out some information that you already may be aware. As this is still unresolved questions to Harrisburg Central Office from another geological era there is no need for a regional response to this email and provided as "food for thought". However, feel free to criticize, complement, curse, or question these concerns.

There is also a four part article in Timesonline that might be of interest that was posted in the Marcellus Formation group in LinkedIn:

[http://www.timesonline.com/news/local\\_news/fracking-wastewater-can-be-highly-radioactive/article\\_ac1dd0e8-5a2f-57aa-8c5d-1d80273e261e.html](http://www.timesonline.com/news/local_news/fracking-wastewater-can-be-highly-radioactive/article_ac1dd0e8-5a2f-57aa-8c5d-1d80273e261e.html)

This article provides information on alleged health effects on a person that hauled wastewater. This series of articles does also provide information on the PADEP forms and analysis and background information.

The PADEP News Release is at:

[http://www.portal.state.pa.us/portal/server.pt/community/news\\_releases/14288](http://www.portal.state.pa.us/portal/server.pt/community/news_releases/14288)

*"Drill cuttings and other materials associated with oil and gas have occasionally triggered radiation monitors at landfills. DEP's data indicates that less than half a percent of all drill cuttings produced by the Marcellus Shale industry in 2012 that were disposed of in landfills triggered radiation monitors. The cuttings did not contain levels of radioactivity that would be harmful to the public, and they were safely disposed of in the landfills."*

However, one question that could have been easily answered but was not in an email to PADEP in a February 20, 2011 email. This email (attached to this email) was mainly on the Hazleton reclamation site but also had concerns on drill cuttings proposed for unlined reclamation sites and lined landfills. This was one of the concerns from this email that the PADEP Office of Chief

Counsel would not allow (Socash, Leib, or others) to address due to (unrelated) litigation.

"4. Are the typical radiation (example: Ludlum Model 375P-1000 for area landfill monitoring) adequate to measure potentially radioactive parameters associated with the Marcellus formation and other marine shale formations above the Marcellus formation?"

Note that wastewater had high alpha and beta radiation as noted in analysis from the Harvard Law Center letter dated November 2011. The alpha and beta in the wastewater (not solids but still relevant) were over 10,000 picocuries per liter with normal background levels (experience, EPA Dimock, EPA RADNET, and various sources) expected in the upper aquifers of single to tenths of a digit picocuries per liter. Then it would seem logical that alpha and beta could be of concern in cuttings and liquids (typically absorbed on sawdust or types of lime wastes). Considering this new data and proposed study would wonder if the OSHA concerns on this attached email might also be revisited.

The main point is that landfill radiation monitors are typically well above the incoming trucks and not sure but believe this is for gamma radiation. Yet, to measure alpha or beta radiation you would need to have detectors almost on top of the waste to do this correctly. Alpha and beta can easily be blocked even by normal clothes BUT breathing in dust with radioactive elements emitting this type of radiation can possibly be a serious health hazard. Feel free to comment on any misconceptions that I have on landfill radiation monitors but believe this was a serious question never responded to by PADEP approaching two years. Are the typical landfill radiation detectors installed at landfills adequate? I am no expert on landfill monitors but do recall that you need to almost be on top of alpha and beta radiation sources to detect problems. Also it seems that emitters do not necessarily always have proportional alpha, beta, and GAMMA radiation. Seems to be a question that would not require years to answer.

These questions are still addressed to PADEP Central Office specifically the Deputy Secretary of External Affairs and just provided here for your information and consideration. I do expect an answer at some point from Harrisburg with enough persistence. Feel free to discuss, forward, and play "devils advocate" on these concerns. If done correctly it would seem this proposed study could address these questions and others concerns although there seems to be little excuse not to address concerns well over a year old.

In a message dated 1/14/2013 11:49:10 A.M. Eastern Standard Time, Mellow5n2@aol.com writes:

Another important source that I had intended to include in the previous email is the summary of radon information in the very nicely done "Pennsylvania Water Quality, 2nd Edition" book by Mr. Brian Oram. Note that on Table 5 (Page 33) the summarized median (a statistical type calculation apparently lost on Central Office folks) values for indoor radon for eleven counties ranges from 3.7 pCuries/liter to 25 pCuries/liter. Most of the values being in single digit ranges. This summary references AirCheck, Inc. that might also be a valuable resource.

In a message dated 1/14/2013 11:32:54 A.M. Eastern Standard Time, Mellow5n2@aol.com writes:

The objective of forwarding this (unresolved and unanswered) email is to provide some information on background radiation that may provide some insight for the PV investigation. Note that the EPA RADNET database has quite a few samples that can be sorted for various environmental media. In this case, used Alpha, Beta, Radium 226, and Radium 228. Note that the values for Pennsylvania over a considerable time period are relatively small values and not even close to the analysis of over 10,000 picocuries per liter for alpha and beta that seems to represent Marcellus wastewater that was put on roads and attached to a PADEP form. In looking at this issue, also looked at the EPA sampling at Dimock that is available on the OSC website for download. The 53-pages of radiation data for Dimock showed expected radiation values that should be in the lower Catskill Formation (similar geology as in much of the PV study area) with alpha, beta, and radium being in the single digit to tenths of a digit picocuries per liter. While not radon, it does seem that this data might be considered (RADNET and Dimock) in anticipating normal background values.

Although looked at this data for another reason, the possibility of using these databases on expected background might be of use. The review of additional data is on-going but seems like just this tidbit of information was enough to stall out any response from Harrisburg at this point. Note that the authors of the Harvard Law School November 2011 letter seem to have no problem with my interpretation of my follow up on their points in their 53-page (also not resolved but not ignored just not responded too according to Harrisburg) letter on concerns on "beneficial reuse" of Marcellus wastewater.

Regarding the PV investigation it seems that radon might be a significant concern, yet geological conditions would seem to dictate that if radon was significant PV factor there should be more widespread cases (due to similar geology that extends even into Marcellus drilling areas, and limited areas of metamorphic/igneous surface geology that should even have much higher radon. It seems like the data on "background" radiation might be limited and of course variable on the geology at the surface and into the used aquifers. Consideration of RADNET and other sources might help assist the direction of where additional data gaps exist.

FYI.

From: Mellow5n2@aol.com

To: Mellow5n2@aol.com, dlapato@state.pa.us

CC: oscette@ptd.net, amshelby@ptd.net, encores@aol.com, dcs@damascuscitizens.org, jruch@peer.org, dgoldberg@earthjustice.org, sgoho@law.harvard.edu

Sent: 10/23/2012 4:08:24 P.M. Eastern Daylight Time  
Subj: Re: Harvard Law Center correspondence on WMGR064

The objective of this additional email is to provide additional support to the (see below) September 6, 2012 email on radiation concerns in the Marcellus wastewater that appears to have been used on public roads. The concern noted was the relatively high gross alpha, gross beta that exceeded 10,000 picocuries per liter. The radium-226 and radium-228 was also in the plus thousand picocuries per liter. The anticipated "background" concentrations for these parameters would be in the fraction to tens of picocuries per liter, and logically for the typical groundwater formations in that area orders of magnitude below concentrations in the tens of thousands of picocuries per liter. The following information was available from the U.S. Environmental Protection Agency (EPA) Envirofacts Internet site and specific search for Pennsylvania on RadNet for specific parameters in drinking water media.

The radiation in drinking water ranges from data collected from the period 1978 to 2012 and the location average would be Pennsylvania, and the overall (multi-state) average includes Pennsylvania.

The Gross Alpha consisted of 159 samples. The location average was 0.256 picocurie/liter with a range of below detection (0) to 8 picocuries/liter. The multi-state overall average was 1.42 picocurie/liter.

The Gross Beta consisted of 160 samples. The location average was 2.34 picocuries/liter with a range of below detection (0) to 6.35 picocuries/liter. The multi-state overall average was 3.09 picocurie/liter.

Note that in the above EPA monitoring the concentrations are well below the 10,000 plus picocuries/liter concentration.

The Radium-226 consisted of 86 samples. The location average was 0.00922 picocurie/liter with a range of 0.07 to 0.2 picocuries/liter. The multi-state overall average was 0.356 picocurie/liter.

The Radium-228 consisted of 120 samples. The location average was 0.00258 picocurie/liter with a range of non detect to one sample of 0.31 picocuries/liter. The multi-state overall average was 0.0688 picocurie/liter.

Note that the above EPA Radium 226 and Radium 228 concentrations are well below 892 and 2,589 picocuries/liter in the wastewater samples noted below.

Once again it appears PADEP (Harrisburg) is statistically challenged regarding my concerns on poor statistical calculations at the Hazleton Creek Properties site now over two years old since the submittal of the original letter, and the concerns of the Harvard Law Center letter since November 2011.

Aside from the Marcellus concerns there has been no indication when **PADEP** will respond to my concerns on the HCP site that encompasses letters and emails back to September 23, 2010. These were summarized in my letter to you dated September 10, 2012. It should be disturbing that a simple statistical calculation should take over two years with still no information if it ever will be addressed.

In a message dated 9/6/2012 11:42:30 A.M. Eastern Daylight Time, Mellow5n2@aol.com writes:

Thank you for the telephone conversation this afternoon. I will organize a letter that summarizes the specific issues and correspondences and emails over the last approximate two years as discussed on the Hazleton Creek Properties site. I have copied representatives of the Hazleton groups SUFFER and CAUSE on this email so they are aware of my attempt to get these letters/emails addressed and note that they are free to agree or disagree that my concerns are separate from the past (and completed) litigation. I have also copied representatives of the Gas Drilling Awareness Coalition and Damascus Citizens that I have discussed issues in the past (and the state has wasted money investigating activities) due to the Marcellus concerns. It will take a few days to get this letter out and the objective of this email is a separate concern regarding the Harvard Law School Emmett Environmental Law & Policy Clinic dated November 16, 2011 correspondence on General Permit WMGR064. These comments were specifically on using natural gas well brines for dust suppression and road stabilization. This letter can be found at: <http://www.law.harvard.edu/academics/clinical/elpc/publications/elpc-comments-on-wgmr064-final-11.16.11.pdf> . This link provides the full 56-page correspondence with attachments. I was curious and contacted one of the authors of this letter and she noted that PADEP had not responded to this very detailed letter.

In our telephone conversation you were not aware of any use of Marcellus wastewater being utilized on public roads. Please note that this Harvard Law Center correspondence has the PADEP Form 26 R Annual Report by a generator. In this case, the generator is Ultra Resources natural gas wells in Tioga County. The following is copy/pasted from this form:

***"Ultra generated produced water from the Marshlands Unit #1 and Marshlands Unit #2 wells in 2009. Approximately 193,788 and 16,800 gallons of produced water were disposed from the Marshlands Unit #1 and Marshlands Unit #2, respectively."***

It would seem if the question: "Has any Marcellus wastewater been used for beneficial reuse for deicing or dust suppression?" could be answered negative on the logic that the "beneficial reuse" box is not checked at six dust suppression locations.

However, this seems to be from drilling in the Marcellus formation and would be brines from Marcellus and other formations, and any additives used during the initial drilling of these Marcellus exploration wells. The waste description (defined as wastewater by PADEP and the generator) is from drilling activities as stated in the Waste Description section:

**SECTION B. WASTE DESCRIPTION**

**Residual Residual Waste Unit of Time**

**Waste Code Code Description Amount Measure Frame**

**801 Drilling Fluids, Residuals (Produced Water) 193788**

During our conversation it appears that it was stated there was no use of this type of water for dust suppression. Yet, in the Form 26 it appears that six locations have already received this wastewater if I am reading this form correctly. It would appear that the following locations have already used this water for dust suppression:

Richmond Township for dust suppression 101,640 gallons  
Troy Township for dust suppression 6,300 gallons  
Delmar Township for dust suppression 5,460 gallons  
Jackson Township for dust suppression 6,300 gallons  
Clymer Township for dust suppression 6,048 gallons  
Elk Township for dust suppression 3,780 gallons  
Tioga Township for dust suppression 12,600 gallons  
Covington Township for dust suppression 6,300 gallons  
Roseville Borough for dust suppression 6,972 gallons

Again feel free to point out if I am not reading this form correctly but seems that just this one attached annual report from one company and one drilling location (two wells) might imply this might be even more common ("tip of iceberg" on what has already been placed on roads or other public locations?) that many would suspect.

The second part of this email concerns the attached analysis from one of the two wells and may represent very limited data. On the potential threat to public health and environment, please note that attached analysis and consider some of the concentrations just on a cursory personal review of this data.

Barium 1,160 parts per million

Lead 0.31 parts per million or 310 parts per billion (consider 15 parts per billion is drinking water advisory)

Lithium 145 parts per million (this is not even common in my experience in groundwater)

Molybdenum 0.44 parts per million or 440 parts per billion

Strontium 4,280 parts per million (this may be of serious concern and seems very high)

The field pH was slightly acidic (5.8) although quite a bit of calcium in the water. Typically high calcium might be expected to put the wastewater on the slightly alkaline (7.0 or above) side of the pH scale. Note that some of the above analysis is dissolved (field filtered prior to analysis) and some is total metals.

There are detections of volatile organic compounds (VOCs) and tentatively identified organic compounds (TICS) that would be difficult to determine concerns based on only one sample.

HOWEVER, the most eye opening part of this limited analysis was the radiological parameters. While I would not be surprised at single digit or even an occasional few hundred picocuries per liter (a small but conventional concentration unit) in samples some of these were in the tens of thousands of picocuries per liter. Note the Gross Alpha, Gross Beta, and Radium 226 and 228 concentrations. I would suspect that radiological parameters at this magnitude should be of some concern used at public locations with no monitoring. Even natural deep marine shales can have significant natural concentrations that are not common (or close to background) to surface formations. It would seem to be prudent that the above concentrations of this limited analysis should be questioned on placing this on public roads and areas. Other reviewers might find other parameters that are also questionable and I only pointed a few that seemed to really stand out.

Please note that the controversial Dimock data samples by U.S. Environmental Protection Agency (EPA) are available ([www.epaossc.org](http://www.epaossc.org)) on the U.S. Environmental Protection Agency On Scene Coordinator website. The Dimock radiological samples are analyzed by Summit Analytical Lab and were collected January/February 2012). A review of the Dimock Radiological Data Weeks 1 - 5 and 1st Round Supplemental Data (53 pages) shows alpha, beta, Radium-226, and Radium-228 typically in single digit picocuries per liter with almost all of the Dimock analysis under 100 picocuries per liter. Yet the analysis included in the Harvard Law Center letter shows analysis (12/30/2009 collection date) for one of the two wells with PADEP apparently having no problem with radiological parameters over 10,000 picocuries per liter being utilized on public roads. **A notable example is Lab ID 0917259 01 that had a gross alpha of 10356.0 +/- 2186.0 picocuries per liter, gross beta of 11595.0 +/- 723.0 picocuries per liter, Radium-226 of 892.0 +/- 32.2 picocuries per liter, and Radium-228 of 2589.0 +/- 128.0 picocuries per liter.** It would have seemed technically logical to be concerned on these relatively high concentrations before being utilized on public roads.

Again, there is the possibility that my interpretation of the Form 26R is not correct, but seems straightforward on annual volumes and locations. The Harvard Law Center also has concerns on the radiological parameters and the lack of general testing for these parameters that has not been addressed. Thank you for any clarifications on my concerns and information on how this

referenced Harvard Law Center correspondence was addressed by PADEP.



jsmemailss02202011.pdf